Chilton's

DECEMBER 14, 1983

IRON AGE

THE MAGAZINE FOR METALWORKING MANAGEMENT

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DOCTOR FED
INTEREST RATES
RECESSION
ECONOMY RECOVERY ROOM
"WELL, YOU LOOK GOOD! HOW WOULD YOU LIKE THE SAME OPERATION OVER AGAIN?"

SCRAPBOOK OF 3rd BUSINESS HUMOR Annual AMERICAN

MANUFACTURING SYSTEMS SERIES 47: THE COMPUTER INVADES MAINTENANCE

PERSONAL COMPUTERS IN BUSINESS: THE SCRAMBLE FOR A BIGGER PIECE OF THE PIE

VOL. 226, NO. 30

IRON AGE

DECEMBER 14, 1983

COVER STORY

23 THIRD ANNUAL SCRAPBOOK OF AMERICAN BUSINESS HUMOR
America's top cartoonists had a field day in 1984, blasting away at industry and government officials, top to bottom. Little escaped their wit and irony, including the deficit, economic recovery, the environment and foreign policy.

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After a long wait.

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PERSONAL COMPUTERS LOOK FOR ROOM ON THE FACTORY FLOOR

Though widely accepted for office use, the personal computer faces a host of obstacles in its bid for a role in manufacturing operations.

BY ROBERT E. HARVEY

Personal computers (PCs) are beginning to make their mark in the office. They are used to communicate, calculate and organize. They are being networked so that they can talk to each other, share resources (like a printer), and communicate with large, mainframe computers. In short, they have secured a substantial beachhead.

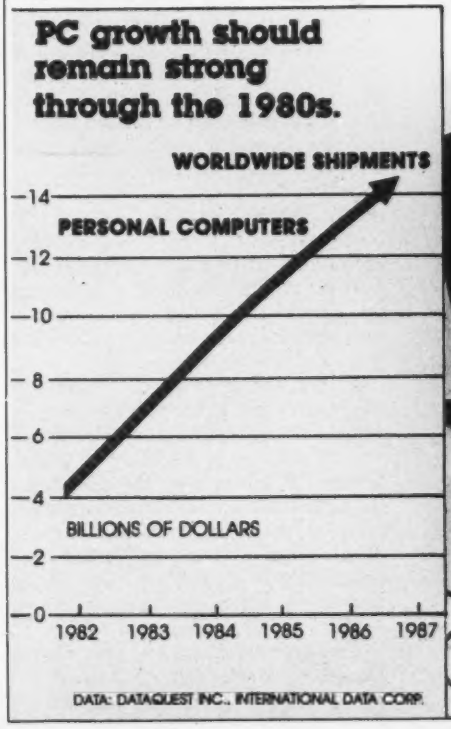
In manufacturing areas, personal computer use is also on the rise, but there the beachhead is more tenuous. Computers supporting shop operations are in an environment more hostile than the front office. They are confronted with a wide variety of exotic control equipment, an unfriendly management information services (MIS) department, and little possibility of network support.

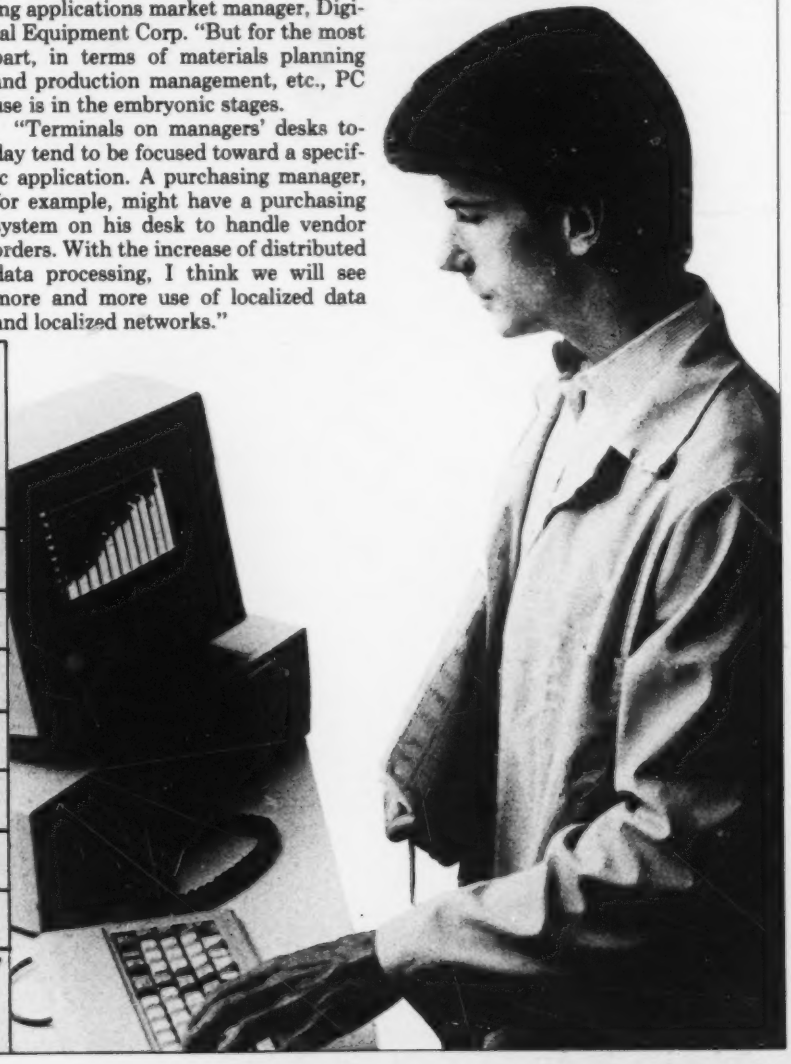
Despite the obstacles, many predict an explosion of PC use in manufacturing support operations.

"We have not even begun to see PCs used in manufacturing. Most of the applications so far have been spread sheets, financial packages, that kind of thing," says Peter Zotto, manufacturing applications market manager, Digital Equipment Corp. "But for the most part, in terms of materials planning and production management, etc., PC use is in the embryonic stages.

"Terminals on managers' desks today tend to be focused toward a specific application. A purchasing manager, for example, might have a purchasing system on his desk to handle vendor orders. With the increase of distributed data processing, I think we will see more and more use of localized data and localized networks."

The personal computer revolution will arrive when the purchasing manager, the process planner and the rest, begin to realize that personal computers offer them the ability to exercise more control over their work. As opposed to being tied into some type of computerized factory system, the PC gives a manager the ability to find out





A Survey of Personal Computers

Company	APPLE	COLUMBIA	DEC	HEWLETT PACKARD	IBM
Computer	Lisa	Columbia MPC	Rainbow 100	HP-150	IBM PC
Microchip	68000 (32 bits)	8088 (16 bits)	Z80 (8 bits)/ 8088 (16 bits)	8088 (16 bits)	8088 (16 bits)
RAM (max)	1M bytes	1M bytes	256 K bytes	640K bytes	640K bytes
Operating System	Lisa	CP/M, MS-DOS	CP/M, MS-DOS	MS-DOS	PC-DOS
Languages	none (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)
	Apple Computer Inc. 10260 Bandley Drive Cupertino, CA 95014 (408) 996-1010	Columbia Data Products, Inc. 8990 Route 108 Columbia, MD 21045 (301) 992-3400	Digital Equipment Corp. 200 Baker Ave. Concord, Mass. 01742 (617) 264-4111	Hewlett Packard Personal Office Computer Div. 974 East Arques Ave. Sunnyvale, CA 94086 (408) 720-3000	IBM General Services POB 2150 Atlanta, GA 30342 (404) 238-2000

what would happen if—if he did this, or if he did that—instead of business as usual.

More importantly, the personal computer is a product that arose out of individual needs, not corporate needs. The greatest attribute of the PC is the fact that a person can get his arms around it, interact with it. It is a friendly doorway into a computerized universe. Right now, individual, personal computer-generated islands of knowledge are springing up throughout industry. The next step is to make this knowledge portable to other individuals in the firm who might need it.

"Many companies are really struggling with the whole concept of data resource management and how to handle distributed data bases," says Mr. Zotto. "It has always been a top down effort. Some companies are struggling because there is no bottom up understanding of what is happening. There are these islands of knowledge that somehow never get connected and there is no easy vehicle to connect them other than a human meeting.

"What will happen is that PC usage will make data resource management happen in the manufacturing environment, because it is going to make visible, for the first time, the availability of information on the user's terms rather than on some corporate MIS terms."

As the PC enters the factory, it will be used in three major ways, outlines Gaylan Larson, general manager, Manufacturing Productivity Div., Hewlett-Packard Co.

—As an intelligent work station.

A lot of processing can be done right at a work station if that station is intelligent. If the work station can do the work, it makes more sense to do that processing right on station instead of going through a larger computer like a main frame and waiting for a response.

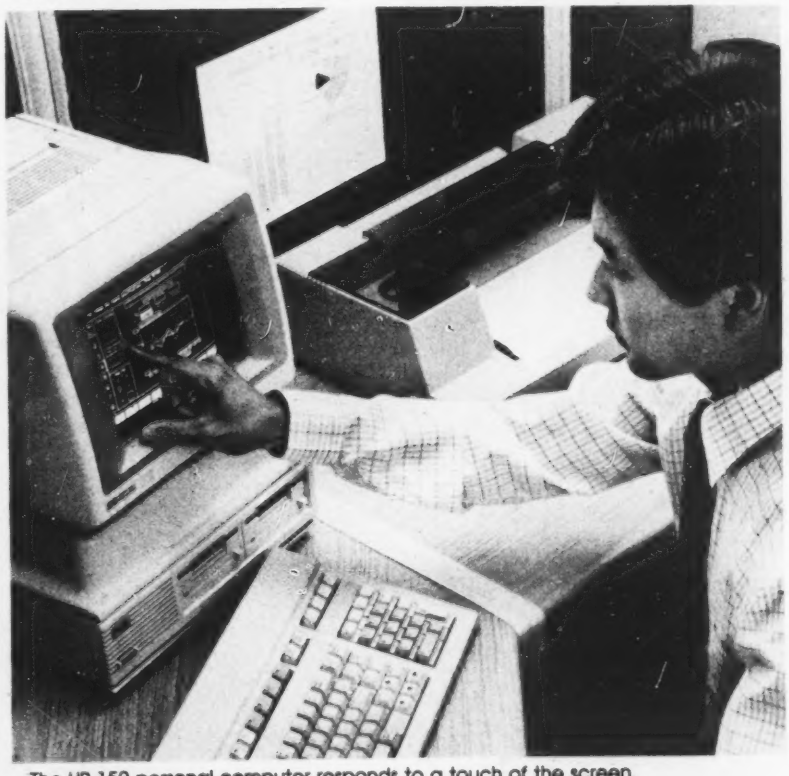
"An example of when use of this local intelligence would be beneficial is production planning," suggests Mr. Larson. "With production planning, you are iterating with a plan in order to see what happens when you twiddle this or change that."

This is asking "what if?" questions, questions like: "If I make this product, what will happen to my total output?"

This activity is modeling of a sort. On the PC, an engineer can quickly get his model straight and then update his plan on the main computer. He can effectively employ the distributed computing power available in the PC to make more timely plans and decisions.

—As a tool for analysis.

The engineer wants to know what is happening on the factory floor. A PC can help him analyze the situation.



The HP 150 personal computer responds to a touch of the screen.

KAYPRO	TANDY	SPERRY	VICTOR	WANG	XEROX
Kaypro II	Tandy TRS-80 Model 2000	Sperry PC	Victor 9000	Wang PC	Xerox 16/8
Z80 (8 bits)	80186 (16 bits)	8088 (16 bits)	8088 (16 bits)	8086 (16 bits)	8086 (16 bits)/ Z80 (8 bits)
64K bytes	256K bytes	640K bytes	894K bytes	640K bytes	128K/64K bytes
CP/M	MS-DOS	MS-DOS	MS-DOS, CP/M	MS-DOS, CP/M	MS-DOS
BASIC (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)	BASIC (Several Optional)	BASIC, C (Several Optional)
KAYPRO Div. of Non-Linear Systems, Inc. 533 Stevens Ave. Solana Beach, CA 92075 (800) 447-4700	Radio Shack 1300 One Tandy Center Fort Worth, TX 76102 (817) 390-3011	Sperry Corp. Computer Systems P.O. Box 500 Blue Bell, PA 19424 (215) 5420-4213/2504	Victor Business Products 3900 North Rockwell St. Chicago, IL (312) 539-8200	Wang Laboratories Inc. One Industrial Ave. Lowell, MA 01851 (617) 851-4111	Xerox Office Products 1341 Mockingbird Lane Dallas, TX 75247 (214) 960-3000

"For example," suggests Mr. Larson, "an engineer might want to examine an automated process, so he would gather up lots of data off the main computer network, which is out there sensing what is going on and is tracking the product. Then, he would want to do some correlations with the information."

—As a control device.

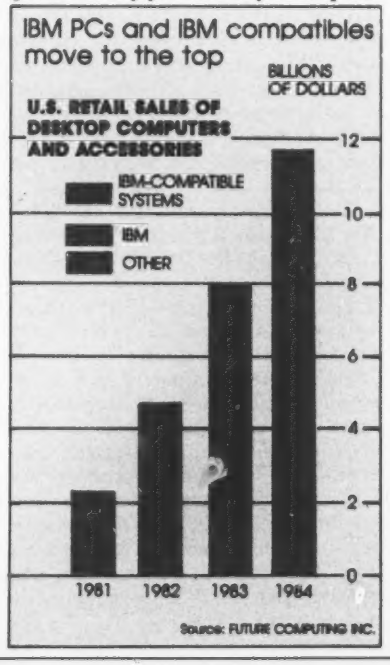
Of the three ways in which a PC is now being used in the factory, its ability to control a process or another machine is the least utilized. However, instances do exist today, where a personal computer does act as a controller. IBM, for example, has introduced a robot arm that is operated by a PC. And depending on how broadly the personal computer is defined, powerful microcomputers and the newly developed supermicros already are usurping some of the control functions of the minicomputer in the factory.

"There is a lot of activity in industry aimed at using personal computers to control processes," says Mr. Larson. "And there are a lot of small applications out there where a PC could do well. It probably could benefit a small water treatment facility which only needs to adjust the pH factor before waste gets dumped, for example. It could manage the valves and sense the conditions and then log what is happening over time."

What will this personal computer be controlling? "It could be a programmable controller, but more likely it is going to be some digital-to-analog converter boards or some boards to sense voltages from transducers measuring temperature, pH pressure, and so on," says Mr. Larson.

A number of people have reservations about the prospect of using the typical personal computer extensively for control purposes.

"The primary reason for having some sort of an intelligence in the control application is not for the sake of an operator, but for the sake of interfacing with a machine or process. And for that very reason, you have to look at what are the main functions of personal computers vs. other types of controllers," says Denny LaBarge, product manufacturing applications marketing manager, Digital Equipment. "I would maintain that the orientation and the requirements for the process interface will drive us to keep the controller concept alive. And as control becomes more sophisticated, quite honestly you reduce your requirements for operator interface."



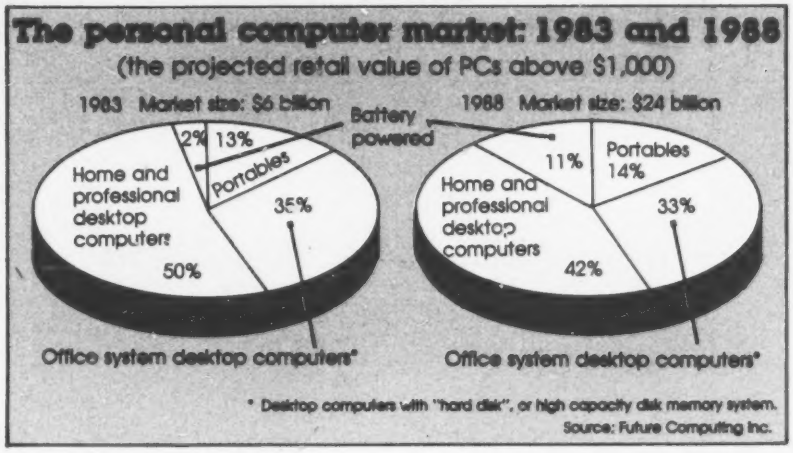
Instead of a PC, a microcomputer or a supermicrocomputer probably would work better for control. These devices, although more expensive than a PC, are much more capable of doing multiprogramming functions. In other words, they can handle a multitude of tasks while interfacing with an operator.

"While I don't see the PC being too heavily involved in process or machine control, I see it serving to support engineering and office-related functions out in the factory," says Mr. LaBarge. "There may be oases out in a factory, oases of clerical expertise, for example, that could use a PC to help determine things like work loads."

With its planning and analyzing abilities, the PC is moving deeper into the factory and closer to where the action is. At present, for all the factory applications for the PC, the computer is still housed in a relatively clean environment—usually an air conditioned office. But eventually, it should begin appearing on the shop floor.

"There are some discussions underway at Digital about the possible ruggedization of a PC, so perhaps it can be stuck on a desk right in the production area with minimal protection around it," says Mr. LaBarge. Housed in a rugged cabinet, the PC could then be used by a shop floor foreman.

As it spreads out into the factory, the personal computer will become involved in an increasing number of factory operations. "One area where personal computers definitely will have an impact is quality control," says Mr. LaBarge. "Considering the station orientation of a lot of quality applications, there is a definite possibility for putting personal computers into that



environment."

At these stations, reliability engineers would perform tests on work-in-progress and incoming piecework. They would run analyses, do historical trending, and anything else that goes with the quality process.

—IBM and standards.

One of the major problems of adapting PCs to a factory environment is incompatability, incompatibility with rival PCs and with other computer systems. Every PC can operate only in a particular range of software. Often, software packages that can operate on one type of PC cannot operate on another.

The lack of software standards for the PC, however, may be coming to an end. A trend clearly is developing to build computers that are more or less compatible with the IBM PC. For example, in the past month, three companies—Sperry Corp., Tandy Corp., and ITT Corp.—jumped on the IBM bandwagon.

All told, over a dozen firms have produced computers that are compatible to some degree with IBM software. All the firms that are somewhat compatible with IBM use the same operating system: MS-DOS.

The operating system mediates between the physical computer and applications software that enables the computer do a specific task, such as word processing or accounting. However, just because two computers use the same operating system, it does not automatically follow that they are completely compatible.

"The PC that we brought to the marketplace, which is MS-DOS and bit-for-bit compatible with the IBM PC, was done for the specific reason that we believe that the IBM PC has established a standard and will be important as a standard in the world market," reports Robert C. Rosenbaum, director of network systems marketing, Sperry Corp. "In addition, we believe that the PC has got to be able to connect with the bigger world."

To forge this connection, Sperry built in asynchronous communications and provided asynchronous software. Sperry's designers also made sure their PC could communicate with IBM and Sperry systems.

"With all its potential communications links, Sperry is now looking at ways to combine its PC with other equipment in order to offer specific systems packages to the marketplace—looking at how we tie it into units, how we tie it into CAD/CAM, for example, how we put it together into a usable system. We see that if we just make the PC communicate with Sperry mainframes, we eliminate a significant marketplace," says Mr. Rosenbaum.

More and more firms are trying to challenge IBM at its game rather than starting up their own game this late in the season. Sperry plans to compete with IBM by reportedly offering 50 pct more internal speed than the IBM PC as well superior displays and color graphics. Sperry is also aiming at producing a machine that sells for 10 pct less than the IBM.

IBM's long shadow also has fallen over the Tandy Corp. It is introducing a IBM-compatible PC, making Apple reportedly the only major manufacturer that has not adopted IBM's operating system, and even Apple reportedly will conform in the future.

With the introduction of its TRS-80 Model 2000, Tandy wants to change its image as a computer maker. To help sell the offering to businessmen who think that Radio Shack products are not primarily geared for the office, Tandy dropped 'Radio Shack' from the new computer's name. Tandy executives state that the new machine will be faster than the IBM, have more disc storage, and will cost less.

ITT, attempting to become a computer power after a late start, has also announced that its new personal computer is IBM compatible. The ITT Xtra, which will be available in April, will be slightly cheaper than the IBM and the first in a long line of office automation products, say ITT officials.

Another product that will be available next year is Hewlett-Packard's HP-150. It also is somewhat compatible with the IBM PC, running the MS-DOS operating system.

But the HP-150 has several features that potentially make it well suited for the industrial environment.

The new computer features a touchscreen display, which means that operators can run computer programs with a touch of a finger or a pen.

"We see two main advantages of this product for factory operations," reports Mr. Larson. "One is that touchscreen means easier interaction for the operator. You can draw pictures and write things on the screen and all the operator has to do is touch them, so ease of use becomes rapidly intuitive. Another thing is that we don't have to have a keyboard and the touch screen is much more reliable in contaminated environments.

In discussion of personal computers, IBM and its recent impact on the PC market cannot be overlooked.

"When IBM entered the PC marketplace, everyone assumed that, as always, IBM would make its mark. But nobody assumed that IBM would be accepted as well as they have been," explains Thomas S. McCaffrey, vice president, worldwide marketing, Sperry. "A primary reason for IBM's success was their offering of an 'open system.' Almost any information that a third party needed to develop either hardware or software was made available. The result: many application programs were written for what grew into a huge market and the IBM personal computer became the predominant PC, with the largest selection of applications available today."

Today, Sperry, Tandy, Hewlett-Packard and a number of other computer manufactures are using MS-DOS and are compatible in some degree to the IBM computer. And even if software, designed specifically for IBM is not completely compatible with a Sperry or a Tandy PC, a software producer can, without a great deal of trouble, alter the software to accommodate the non-IBM computer.□

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MATERIALS NEWSFRONT

Price & Production Data

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	194	183	179	138
Buffalo	9	9	9	30
Pittsburgh	227	210	233	80
Youngstown	89	59	112	50
Cleveland	141	138	142	61
Detroit	136	127	138	114
Chicago	516	513	497	268
Cincinnati	90	89	76	54
St. Louis	73	65	75	32
Southern	159	149	139	62
Western	76	69	73	45
U.S. Production	1,710	1,611	1,673	934

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)..... gross-ton 80.50-86.9*
Old range, non-bessemer ..... gross-ton $32.78
Mesabi, regular-unscreened ..... gross-ton $32.53
Mesabi, non-bessemer.....gross-ton $30.03-31.53**

*80.50¢—Pickands Mather as of 1/27/81.
86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.
**Effective 8/1/83.

Steel Production, Composite Prices

(Effective December 5, 1983)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1983	To Date 1982
Net tons, in thousands	1,710	1,611	76,959	67,064
Capability Utilization Rate	59.3	55.8	55.3	47.2

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 9/1/83)	26.822	26.822	26.822	25.297
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 86.17	$ 84.50	$ 79.17	$ 51.17
No. 2 bundles	$ 54.50	$ 52.50	$ 47.50	$ 38.50

Scrap Comparison (Gross Ton)

No. 1 steel, Pittsburgh .	$ 90.50	$ 88.50	$ 84.50	$ 52.50
No. 1 steel, Philadelphia	83.50	80.50	73.50	54.50
No. 1 steel, Chicago.....	84.50	84.50	79.50	46.50
No. 1 bundles, Detroit..	86.50	81.50	81.50	41.50
Low Phos., Youngstown	88.50	84.50	84.50	51.50
No. 1 mach'y cast., Pgh	79.50	79.50	74.50	61.50
No. 1 mach'y cast., Phila	97.50	95.50	95.50	98.50
No. 1 mach'y cast., Chi..	111.50	111.50	109.50	103.60

*Finished Steel Composite
Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
* *Pig Iron Composite
Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
* * *Steel Scrap Composite
Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective December 5, 1983)
Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	81.00	76.00-81.00	9/27/83
Copper (C)	69.00-71.00	68.00-69.00	11/29/83
Lead	25.00-27.00	26.00-27.00	10/27/83
Magnesium Ingot	138.00	134.00-138.00	6/1/83
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	49.00	46.00-49.00	10/25/83

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig, delivered. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas . $2.00
Beryllium-aluminum 5% Be, per lb. contained Be.....$215.00
Beryllium-copper, per lb. cont. Be $130.00
Beryllium 97% powder 200 .....$178.00
Bismuth, ton lots .....$1.80-$1.90
Cadmium, ton lots $1.25
Calcium, ton lots, crown $3.05
Chromium, 99.8% $3.75
Cobalt, 99%, cathode $12.50
Gold per troy oz. $397.25
Indium, dollars per troy oz.....$3.20
Iridium, dollars per troy oz.....$600
Magnesium sticks, 10,000 lbs. $1.91
Mercury, per 76-lb. f.o.b. N.Y. ..$330-$340
Molybdenum, lb. tech. moly oxides, 20 lb. MO can $5.85
Nickel oxide sinter at U.S. points of entry $3.12
Palladium, per troy oz. $140
Platinum, per troy oz.....$475
Rhodium, per troy oz. $600.00
Silver ingots, per troy oz.....$9.34
Vanadium $4.94
Zirconium sponge.....$12.00-$17.00
(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Nov. 28—584.05 Dec. 1—580.75
Nov. 29—582.70 Dec. 2—578.68
Nov. 30—583.38

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	66½	61
Yellow brass	57½	56½
Red brass	61¼	58
Comm. bronze	61	58¼
Mang. bronze	59¼	57¼
Free cutting rod ends	57	56

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	62
No. 2 copper wire	52
Light copper	3

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	58
No. 2 copper wire	48
Light copper	39
No. 1 composition	52
No. 1 comp. turnings	50
Hvy. yellow brass solids	32
Hvy. yellow brass turnings	28
Radiators	42

Aluminum

New mixed clips	46	—47
Old sheet	43	—44
Old cast	43	—44
Clean dry borings	43	—44

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	40	—41
Mixed L.C. clips	35	—36
Old sheets and cast	33	—34
Borings and turnings	24	—25
Duraluminum clippings	29	—30

Copper and Brass

No. 1 copper wire	50	—51
No. 2 copper wire	42	—43
Light copper	38	—39
Radiators	34	—35
No. 1 composition	43	—44
No. 1 composition turn'gs	41	—42
Cocks and faucets	29	—30
Clean heavy yellow brass	26	—27
Brass Pipe	28	—29
New soft brass clippings	42	—43

Lead

Heavy soft lead	8	— 9
Whole batteries	3	— 4
Type metal	15	—16
Electrotype	13	—14

Nickel

Nickel solids	110	—120
Nickel rod ends	110	—120
Nickel sheets, clips	110	—120
Nickel turnings	50	— 60

Zinc

New zinc clippings	15	—16
Old diecast zinc	10	—11

MATERIALS NEWSFRONT

(Effective December 5, 1983) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 90.00 to $ 91.00
No. 2 hvy. melting	80.00 to 81.00
No. 1 dealer bundles	110.00 to 111.00
No. 1 factory bundles (auto)	113.00 to 114.00
No. 2 bundles	59.00 to 60.00
No. 1 busheling	106.00 to 107.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	46.00 to 47.00
Cast iron borings	45.00 to 46.00
Low phos. punchings plate	109.00 to 110.00
Heavy turnings	80.00 to 81.00
No. 1 RR hvy. melting	106.00 to 107.00
Rails 2 ft. and under	111.00 to 112.00
Scrap rails, random lgth.	99.00 to 100.00
RR specialties	109.00 to 110.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	72.00 to 73.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	600.00 to 610.00
18-8 turnings	500.00 to 510.00

Chicago

No. 1 hvy. melting	$ 84.00 to $ 85.00
No. 2 hvy. melting	77.00 to 78.00
No. 1 dealer bundles	111.00 to 112.00
No. 1 factory bundles (auto)	111.00 to 112.00
No. 2 dealer bundles	49.00 to 50.00
No. 1 busheling	105.00 to 106.00
Shredder scrap	95.00 to 96.00
Machine shop turn.	39.00 to 40.00
Mixed bor. and turn.	40.00 to 41.00
Shoveling turnings	46.00 to 47.00
Cast iron borings	55.00 to 56.00
Low phos. forge crop	109.00 to 110.00
Low phos. punchings plate ¼ in. and heavier	123.00 to 124.00
Low phos. 2 ft. and under	113.00 to 119.00
No. 1 RR hvy. melting	100.00 to 101.00
Scrap rails, random lgth.	93.00 to 94.00
Reroller rails	108.00 to 109.00
Rails, 2 ft. and under	112.00 to 113.00
RR couplers and knuckles	98.00 to 99.00
RR car axles	124.00 to 125.00
No. 1 machinery cast	111.00 to 112.00
Cupola cast	99.00 to 100.00
Stove plate	100.00 to 101.00
Steel car wheels	108.00 to 109.00
Stainless	
18-8 bundles and solids	560.00 to 570.00
18-8 turnings	460.00 to 470.00
430 bundles and solids	135.00 to 140.00
430 turnings	100.00 to 105.00

Philadelphia

No. 1 hvy. melting	$ 82.00 to $ 85.00
No. 2 hvy. melting	70.00 to 73.00
No. 1 dealer bundles	96.00 to 99.00
No. 2 dealer bundles	53.00 to 56.00
No. 1 busheling	96.00 to 99.00
Shredder scrap	94.00 to 97.00
Machine shop turn.	26.00 to 29.00
Mixed bor. and turn.	26.00 to 29.00
Shoveling turnings	45.00 to 48.00
Low phos. 5 ft. and under	94.00 to 97.00
Low phos. 2 ft. punchings	105.00 to 108.00
Electric furnace bundles	109.00 to 112.00
RR specialties	94.00 to 97.00
Rails, 2 ft. and under	109.00 to 112.00
Cupola cast	67.00 to 70.00
Heavy breakable cast	53.00 to 56.00
No. 1 machinery cast	96.00 to 99.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 64.00 to $ 65.00
No. 2 hvy. melting	61.00 to 62.00
No. 1 dealer bundles	86.00 to 87.00
No. 2 bundles	42.00 to 43.00
No. 1 busheling	85.00 to 86.00
Drop forge flashings	60.00 to 61.00
Machine shop turn.	33.00 to 34.00
Mixed borings and turn.	20.00 to 21.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	41.00 to 42.00
Heavy breakable cast	35.00 to 36.00
Mixed cupola cast	51.00 to 52.00
Automobile cast	74.00 to 75.00
Stainless	
18-8 bundles and solids	460.00 to 470.00
18-8 turnings	340.00 to 350.00
430 bundles and solids	125.00 to 135.00

Youngstown

No. 1 hvy. melting	$ 80.00 to $ 83.00
No. 2 hvy. melting	61.00 to 64.00
No. 1 dealer bundles	91.00 to 95.00
No. 2 dealer bundles	37.00 to 40.00
Machine shop turn.	14.00 to 17.00
Shoveling turnings	19.00 to 22.00
Low phos. plate	87.00 to 90.00
Electric furnace bundles	82.00 to 85.00
Galvanized bundles	76.00 to 79.00

Cleveland

No. 1 hvy. melting	$ 76.00 to $ 79.00
No. 2 hvy. melting	44.00 to 47.00
No. 1 dealer bundles	94.00 to 97.00
No. 1 factory bundles	100.00 to 103.00
No. 2 bundles	23.00 to 26.00
No. 1 busheling	93.00 to 96.00
Machine shop turn.	12.00 to 15.00
Mixed bor. and turn.	12.00 to 15.00
Shoveling turnings	14.00 to 17.00
Cast iron borings	17.00 to 20.00
Cut structural & plates, 2 ft. and under	105.00 to 108.00
Low phos. punchings plate	105.00 to 108.00
Drop forge flashings	62.00 to 65.00
Foundry steel, 2 ft. & under	70.00 to 75.00
No. 1 RR hvy melting	87.00 to 90.00
Rails, 2 ft. and under	112.00 to 115.00
Rails, 18 in. and under	113.00 to 116.00
Steel axle turnings	67.00 to 70.00
Railroad cast	94.00 to 97.00
No. 1 machinery cast	97.00 to 100.00
Cupola cast	63.00 to 66.00
Stove plate	48.00 to 51.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	325.00 to 335.00
430 bundles	80.00 to 85.00

Buffalo

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 68.00 to $ 69.00
No. 2 hvy. melting	51.00 to 53.00
No. 1 busheling	79.00 to 80.00
No. 1 dealer bundles	79.00 to 80.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	15.00 to 16.00
Low phos. plate	81.00 to 82.00
Structural and plate, 2 ft. and under	84.00 to 85.00
Rails, 2 ft. and under	95.00 to 96.00
Scrap rails, random lgth.	74.00 to 75.00
No. 1 machinery cast	84.00 to 85.00
No. 1 cupola cast	64.00 to 65.00

St. Louis

No. 1 hvy. melting	$ 77.00 to $ 78.00
No. 2 hvy. melting	66.00 to 67.00
Foundry steel, 2 ft.	66.00 to 67.00
No. 1 dealer bundles	77.00 to 78.00
No. 2 bundles	63.00 to 64.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	38.00 to 39.00
No. 1 RR hvy. melting	87.00 to 88.00
Rails, random length	81.00 to 82.00
Rails, 18 in. and under	97.00 to 98.00
RR specialties	90.00 to 91.00
Cupola cast	70.00 to 71.00
Heavy breakable cast	48.00 to 49.00
Stove plate	80.00 to 81.00
Cast iron car wheels	52.00 to 53.00
Rerolling rails	102.00 to 103.00
Unstripped motor blocks	61.00 to 62.00

Birmingham

No. 1 heavy melting	$ 70.00 to $ 71.00
No. 2 heavy melting	66.00 to 67.00
No. 1 dealer bundles	73.00 to 74.00
No. 2 bundles	52.00 to 53.00
No. 1 busheling	73.00 to 74.00
Shredder scrap	95.00 to 96.00
Machine shop. turn.	24.00 to 25.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	33.00 to 34.00
Electric furnace bundles	68.00 to 69.00
Elec. furnace, 3 ft. & under	76.00 to 77.00
Structural and plate, 2 ft.	101.00 to 102.00
Structural and plate, 4 ft.	93.00 to 94.00
No. 1 RR hvy. melting	94.00 to 95.00
Scrap rails, random lgth.	88.00 to 89.00
Rails, 18 in. and under	103.00 to 104.00
Angles and splice bars	95.00 to 96.00
No. 1 cupola cast	88.00 to 89.00
Unstripped motor blocks	69.00 to 70.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 66.00 to $ 67.00
No. 2 hvy. melting	59.00 to 60.00
No. 1 dealer bundles	76.00 to 77.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	18.00 to 19.00
Low phos. 18 in. and under	95.00 to 96.00
Rails, random length	74.00 to 75.00
Rails, 2 ft. and under	92.00 to 93.00
No. 1 cupola cast	70.00 to 71.00
Heavy breakable cast	36.00 to 37.00
Drop broken cast	84.00 to 85.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 40.00 to $ 45.00
No. 2 hvy. melting	37.00 to 40.00
No. 2 dealer bundles	23.00 to 27.00
Mixed bor. and turn.	11.00 to 13.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	14.00 to 15.00
Clean cast. chem. borings	35.00 to 36.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	45.00 to 46.00
Heavy breakable cast	10.00 to 12.00
Stainless	
18-8 prepared solids	490.00 to 510.00
18-8 turnings	390.00 to 410.00
430 prepared solids	80.00 to 100.00
410 solids	70.00 to 80.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 55.00 to $ 57.00
No. 2 hvy. melting	45.00 to 47.00
No. 1 dealer bundles	73.00 to 75.00
No. 2 bundles	35.00 to 37.00
No. 1 busheling	78.00 to 80.00
Shredder scrap	72.00 to 74.00
Machine shop turn.	10.00 to 12.00
Shoveling turnings	15.00 to 17.00
No. 1 machinery cast	90.00 to 95.00
Mixed cupola cast	45.00 to 47.00
Heavy breakable cast	14.00 to 16.00

San Francisco

No. 1 hvy. melting	$ 44.00 to $ 46.00
No. 2 hvy. melting	36.00 to 38.00
No. 1 dealer bundles	29.00 to 31.00
No. 2 dealer bundles	13.00 to 15.00
Machine shop turn.	6.00 to 8.00
Cast iron borings	6.00 to 8.00
No. 1 cupola cast	73.00 to 75.00

Los Angeles

No. 1 hvy. melting	$ 43.00 to $ 45.00
No. 2 hvy. melting	32.00 to 34.00
No. 1 dealer bundles	27.00 to 29.00
No. 2 dealer bundles	10.00 to 12.00
Machine shop turn.	6.00 to 8.00
Shoveling turnings	10.00 to 12.00
Cast iron borings	6.00 to 8.00
Elec. furnace, 1 ft. and under (foundry)	74.00 to 76.00
No. 1 cupola cast	75.00 to 77.00

Seattle

No. 1 hvy. melting	$ 71.00 to $ 73.00
No. 2 hvy. melting	60.00 to 62.00
No. 2 bundles	40.00 to 42.00
No. 1 cupola cast	96.00 to 98.00
Mixed yard cast	83.00 to 85.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 65.00
No. 2 heavy melting cut 2 ft. and under	62.00
No. 1 dealer bundles	70.00
No. 2 bundles	38.00
Mixed steel scrap	44.00
Bush. new fact. prep'd.	68.00
Bush. new fact. unprp'd.	60.00
Machine shop turn.	33.00
Short steel turn.	36.00
Mixed bor. and turn.	23.00
Cast scrap	58.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 82.00 to $ 83.00
No. 2 hvy. melting	66.00 to 67.00
No. 2 bundles	41.00 to 43.00
Machine shop turn.	22.00 to 23.00
Crushed turnings	44.00 to 46.00
Shredder scrap	82.00 to 83.00
Cut structural plate 2 ft. and under	94.00 to 96.00
Unstripped motor blocks	57.00 to 59.00
Cupola cast	80.00 to 82.00

METALWORKING ORDER TRENDS

Durable orders show economic recovery gaining momentum

America's economic recovery thus far is stronger than the experts had expected.

Durable goods orders for October show the economy is sturdy and continuing strong. Overall orders received in the tenth month came to $93.8 billion, exceeding September's $90.3 billion by 3.1 pct.

The October total was also extraordinarily better than the 1982 figure of $69.8 billion.

The overall picture is a mixed bag—half of the major orders categories were up in October compared with September. Nine were down and four were unchanged. But compared with a year ago, 23 categories are up, with only three down. The increase in orders for durable goods was the largest since the 7.6 pct gain registered in June.

About 75 pct of the October increase in new orders centered in the aircraft and parts industry. Orders there were estimated at $7.6 billion, a $2.1 billion or 37 pct rise over September. The largest decline took place in the steel industry—a 6.3 pct drop to $4.6 billion from September's $4.9 billion.

Another sizeable increase in orders in October occurred in the electrical machinery sector, a $700 million rise to $15 billion.

Also, new orders in October for nondefense capital goods increased for the third consecutive month up $1.3 billion or 5.2 pct to $26.5 billion. That statistic, an indicator of business investment, suggests that companies are increasing their investment in new equipment, which could prolong the recovery.

The Commerce Department's latest quarterly survey of capital spending plans shows business expects the first half of next year to show 3.9 pct more business investment than the last half of 1983, in which spending is increasing at a 6.7 pct annual rate. The latest estimate of spending for all of 1983 is $303.2 billion, slightly less than what businesses anticipated in the July-August government survey.

Manufactured goods shipments declined for the first time since an 0.8 pct drop was registered in July. It was only the second time this year the shipments have dropped. Within the durable goods sector, shipments in virtually all major categories dropped with the exception of primary metals which went up $200 million or 2.1 pct; mainly the result of an increase in nonferrous metals shipments.

Source: U.S. Dept. of Commerce Billions of dollars, seasonally adjusted monthly total, unless otherwise noted		Latest Month or Qtr.	Previous Month or Qtr.	Same Period Year Ago
Capital Expenditures (Annual Rates)				
U.S. Industry, Total	4th Qtr.	$326.7*	$313.0*	$303.2
Manufacturing, Total	4th Qtr.	119.8*	117.4*	110.2
Manufacturing, Durable Goods	4th Qtr.	53.7*	53.0*	50.5
Mining Industry	3rd Qtr.	14.6*	13.3*	13.4
Key Indicators, Durable Goods Manufacturing				
New Orders	Oct.	93.8	90.9	69.8
Shipments	Oct.	87.9	88.9	72.4
Inventories	Oct.	170.6	170.3	182.3
Unfilled Orders	Oct.	317.9	312.0	284.1
New Orders, Metalworking				
Capital Goods Producers, Nondefense Industries	Oct.	26.5	25.2	20.1
Capital Goods Producers, Defense Industries	Oct.	5.6	4.9	4.7
Primary Metals, Total	Oct.	10.8	11.0	6.9
Steel (SIC 331)	Oct.	4.6	4.9	2.8
Iron & Steel Castings (SIC 332)	Oct.	0.2	1.3	0.6
Nonferrous Metals	Oct.	5.0	4.8	3.5
Nonelectrical Mach.-Equip. Industries, Total	Oct.	17.2	17.2	13.9
Engines & Turbines	Oct.	1.4	0.8	1.1
Farm Machinery & Equipment (Shipments)	Oct.	0.9	0.9	1.0
Construction, Mining & Materials Hdlg. Equip.	Oct.	2.5	2.6	2.0
General Industrial Machinery	Oct.	1.5	1.3	1.0
Fluid Power Equipment** (Index-1972=100)	Oct.	270.0	276.0	152.0
Metalworking Machinery	Oct.	0.7	0.7	0.6
Machine Tools, Total (Millions $, unadjusted)***	Oct.	203.0	155.8	119.2
Machine Tools, Metal-Cutting***	Oct.	129.9	102.4	72.8
Machine Tools, Metal-Forming***	Oct.	73.1	53.3	46.3
Electrical Mach. & Equip. Industries, Total	Oct.	15.0	14.3	10.9
Elec. Transmission Equip. & Industrial Apparatus	Oct.	1.8	2.1	1.4
Household Appliances	Oct.	1.2	1.2	1.0
Communication Equipment	Oct.	4.5	4.3	3.7
Transportation Equip. Industrial, Total	Oct.	21.9	19.5	14.3
Motor Vehicles & Parts (Shipments)	Oct.	12.9	13.4	7.9
Aircraft, Missiles & Parts	Oct.	7.6	5.5	5.1
Shipbuilding & Military Tanks	Oct.	0.3	−0.05	0.7
Fabricated Metal Products, Total	Oct.	10.4	10.6	8.4
Instruments, Total	Oct.	4.2	4.3	3.7

*Est.—Commerce Dept.; **Source: National Fluid Power Assn.; ***Source: NMTBA.